EXHIBIT 18

SOAH DOCKET NO. 582-07-2673
SOAH DOCKET NO. 582-07-2674
TCEQ DOCKET NO. 2007-0204-WDW
TCEQ DOCKET NO. 2007-0362-IHW

APPLICATION OF TEXCOM GULF DISPOSAL, LLC FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY UNDERGROUND INJECTION CONTROL PERMIT NOS. WDW 410, WDW 411, WDW 412 AND WDW 413	§	BEFORE THE STATE OFFICE
	§	OF
APPLICATION BY TEXCOM GULF DISPOSAL, LLC FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY INDUSTRIAL HAZARDOUS WASTE PERMIT NO. 87758	§	ADMINISTRATIVE HEARINGS

DIRECT TESTIMONY

OF

MARK SWADENER

ON BEHALF OF

DENBURY ONSHORE, LLC

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DIRECT TESTIMONY OF MARK SWADENER
ON BEHALF OF DENBURY ONSHORE, LLC

Q. STATE YOUR NAME AND BUSINESS ADDRESS.

A. Mark Swadener, 5100 Tennyson, Parkway Suite 1200, Plano, TX 75204.

Q. DO YOU RECOGNIZE THE DOCUMENT THAT HAS BEEN MARKED AS DENBURY EXHIBIT 19?

A. Yes.

Q. DESCRIBE THIS EXHIBIT.

A. It is my resume.

Q. DID YOU PREPARE THIS EXHIBIT?

A. Yes.

Q. IS THE INFORMATION ON YOUR RÉSUMÉ TRUE AND CORRECT?

A. Yes.

Q. DOES YOUR RÉSUMÉ ACCURATELY DESCRIBE YOUR EDUCATION, EXPERIENCE, AND TRAINING?

A. Yes.

DENBURY OFFERS MR. SWADENER'S RESUME AS DENBURY EX. 19

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received my Bachelor of Science degree in Mechanical Engineering from Southern Methodist University in 2004.

Q. BY WHOM ARE YOU CURRENTLY EMPLOYED AND WHAT IS YOUR POSITION?

A. I am employed by Denbury Resources, LLC as a Reservoir Engineer.

Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT POSITION?

A. I am responsible for the engineering and evaluation of the Conroe Field reservoir to maintain and develop oil production. I am also responsible for capital work over and other economic opportunities for the Conroe Field Unit. I am also responsible for designing the future CO2 EOR flood for the Conroe Field Unit to maximize oil production.

Q. DESCRIBE YOUR PAST WORK EXPERIENCE.

A. My past experience includes experience in facilities operation and reservoir engineering with Occidental Permian Limited and Denbury Resources, LLC. With Occidental, I was involved with heritage CO2 flooding (EOR fields) and for Denbury I have been involved in the Jackson Dome CO2 source field. I have experience working in multiple aspects of CO2 production, injection, and processing. I've also been extensively involved in project

planning for enhanced oil recovery projects and CO2 production. As part of my work as the Operations Engineer for the Jackson Dome, I managed projects which brought together Reservoir Engineering, Geology, and operations expertise to design and implement multiple operation plans to most efficiently move fluids in the formation and to the surface for sale to pipeline.

Q. IN THE COURSE OF YOUR PROFESSION, HAVE YOU DEVELOPED AN IN-DEPTH UNDERSTANDING OF WELLBORE MECHANICS AND RESERVOIR CHARACTERISTICS AND HOW THOSE FACTORS IMPACT THE MOVEMENT OF FLUIDS IN A GEOLOGIC FORMATION?

A. Yes.

Q. IN YOUR EXPERIENCE IN BOTH OPERATIONS AND RESERVOIR ENGINEERING, ARE YOU FAMILIAR WITH HOW RESERVOIRS REACT TO PRODUCTION AND INJECTION OPERATIONS?

A. Yes.

Q. DO YOU PARTICIPATE IN CONTINUING EDUCATION ACTIVITIES?

A. Yes. I am a member of the Society of Petroleum Engineers and I attend meetings where technical topics are presented. I have also taken additional courses from Petro Skills, such as Production Operations and other topics relevant to my job responsibilities.

Q. HAVE YOU BEEN ASKED TO TESTIFY REGARDING THE APPLICATION FOR AN UNDERGROUND INJECTION CONTROL PERMIT SUBMITTED TO THE TCEQ BY TEXCOM GULF DISPOSAL, LLC ("TEXCOM") IN MONTGOMERY COUNTY, TEXAS?

A. Yes.

Q. IN WHAT CAPACITY HAVE YOU BEEN ASKED TO TESTIFY?

A. I have been asked to discuss my knowledge of Denbury's current and planned activities in the Conroe field as well as to give my opinion regarding reservoir mechanics and operational issues as it relates to current and proposed operations of both Denbury and TexCom in the Conroe Field.

DENBURY ONSHORE, LLC OFFERS MR. SWADENER AS AN EXPERT IN THE AREA WELLBORE MECHANICS AND RESERVOIR CHARACTERISTICS AND HOW THOSE FACTORS IMPACT THE MOVEMENT OF FLUIDS IN A GEOLOGIC FORMATION.

Q. WHAT IS YOUR FAMILIARITY WITH THE PROJECT THAT TEXCOM IS PROPOSING?

A. I have reviewed their application and plans for the proposed wells.

Q. DESCRIBE ANY ANALYSIS YOU HAVE PERFORMED AS A PART OF YOUR TESTIMONY?

A. I have looked at data from wells within the Conroe Field to evaluate formation pressures and evaluated certain data used in testing performed by TexCom during the remand period from the standpoint of reservoir mechanics and operations.

Q. WHAT RESOURCES DID YOU PRIMARILY RELY UPON IN PERFORMING YOUR ANALYSIS?

A. My experience in wellbore mechanics and my familiarity with wellbore operations and the effects of wellbore pressure from injection and extraction. I relied upon a variety of information regarding the Conroe Field, including well logs, production and operations information, the bottom hole pressure test performed by TexCom, wellbore sketches, the

repeat formation tester (RFT) performed by Wapiti, LLC, and my knowledge of the various plans for future operations.

Q. ARE THESE THE TYPES OF RESOURCES GENERALLY RELIED ON BY EXPERTS IN YOUR FIELD IN EVALUATING SIMILAR ISSUES?

A. Yes.

Q. YOU ARE FAMILIAR WITH THE TEXCOM'S APPLICATION TO BUILD A CLASS I NON-HAZARDOUS DISPOSAL WELL THAT IS SUBJECT OF THIS HEARING?

A. Yes.

Q. HAVE YOU FORMED ANY OPINIONS REGARDING THE OPERATIONS AND RESERVOIR MECHANICS OF THE TEXCOM WELL, AND HOW THAT WELL WILL INTERACT WITH DENBURY'S CURRENT AND FUTURE WELLS?

A. Yes.

Q. BASED ON YOUR EXPERIENCE AND EXPERTISE IN OPERATIONS AND RESERVOIR ENGINEERING, WHAT ARE YOUR CONCLUSIONS?

A. When the pressure profile that will be developed by TexCom interacts with the pressure profile created by Denbury's current and future operations, the interaction of the two will cause TexCom's injected fluids to be produced at the surface.

Q. ARE YOU FAMILIAR WITH DENBURY'S CURRENT OPERATIONS IN THE CONROE FIELD?

A. Yes, as part of my job as a Reservoir Engineer I am responsible for the Conroe Field.

Q. PLEASE DESCRIBE DENBURY'S CURRENT OPERATIONS IN THE CONROE FIELD.

A. Denbury is the unit operator for the Conroe Field Unit. The Conroe Field Unit was created in 1977 by Exxon pursuant to an order of the Texas Railroad Commission. Under the Unit Agreement, Denbury is the sole operator of oil and gas production for the unitized Cockfield Interval. Denbury produces approximately 2,500 barrels of oil per day from the Conroe Field and approximately 240,000 barrels of produced water a day.

Q. PLEASE DESCRIBE DENBURY'S OPERATIONS SPECIFICALLY WITH RESPECT TO HOW THE OIL IS EXTRACTED FROM THE FORMATION?

A. Denbury uses a variety of methods of what is referred to in the industry as artificial lift. In other words, Denbury uses a pump or similar types of mechanical means to lower the pressure at the wellbore and essentially suck the fluid out of the formation. Artificial lift is necessary because current reservoir pressure in the CFU is depleted and therefore insufficient to lift fluids to the surface.

Q. HOW DOES THIS WORK IN TERMS OF PRESSURE?

A. Essentially, artificial lift creates a low pressure point in the wellbore so that the formation fluid is drawn towards the well. Once the fluid is in the wellbore the artificial lift described above increases the fluid pressure so that the fluids will have the energy to reach the surface, i.e., overcome hydrostatic head.

Q. DOES THIS HAVE ANY IMPACT ON THE PRESSURE OF THE RESERVOIR?

A. Yes.

Q. WHAT DOES THIS PRODUCTION DO TO FORMATION RESERVOIR PRESSURE?

A. Production from a formation will reduce reservoir pressure over time.

Q. HAVE YOU SEEN THIS OCCUR IN THE CONROE UNIT?

A. Yes.

Q. HAS THE CONROE UNIT BEEN THE ONLY INTERVAL PRODUCTIVE OF HYDROCARBON IN THIS FIELD?

A. No.

Q. WHAT OTHER ZONES HAVE BEEN PRODUCTIVE OF HYDROCARBONS?

A. Pliocene, Miocene, Frio, Vicksburg, and the Wilcox have all been productive. I don't know if there has been active hydrocarbon recovery below the Wilcox.

Q. HAS THE LOWER COCKFIELD, AS THAT TERM HAS BEEN USED BY TEXCOM IN THIS HEARING, BEEN PRODUCTIVE OF HYDROCARBONS?

A. No.

Q. IN YOUR CAPACITY IN OPERATIONS AND RESERVOIR ENGINEERING, ARE YOU FAMILIAR WITH THE RELEVANT PRESSURES AND PRESSURE GRADIENTS WITHIN THE CONROE FIELD?

A. I am.

Q. HAVE YOU ASSESSED RESERVOIR PRESSURES IN THE LOWER COCKFIELD?

A. Yes. I noted the initial pressure from TexCom's recent fall-off test (before the test was initiated), as well as reviewed pressures in other parts of the Conroe Field.

Q. WHAT WOULD YOU EXPECT THE PRESSURE IN THE LOWER COCKFIELD TO BE?

A. The Lower Cockfield, having never been productive of hydrocarbons, should have its virgin pressure. Making conservative assumptions, the virgin pressure is approximately equivalent to 2800 psi (or expressed in terms of pressure gradient, 0.45 psi per foot). This is a commonly accepted gradient for normally pressured reservoirs such as the Cockfield.

Q. WHAT IS MEANT BY 0.45 PSI PER FOOT?

A. That is a pressure gradient. Essentially, it is determined by measuring the pressure at a given depth in psi, and then dividing by that depth in feet.

Q. WHY IS THIS IMPORTANT IN OIL PRODUCTION OPERATIONS?

A. Understanding the proper pressure gradient is important because hydrocarbons are extracted through proper pressure maintenance and/or artificial lift design.

Q. WHAT DID WAPITI MEASURE AS THE CURRENT PRESSURE GRADIENT IN THE LOWER COCKFIELD?

A. The pressure at 5504 feet was 2186.7 psi, which results in a pressure gradient of 0.397 psi per foot.

Q. WHAT IS THE SOURCE OF THIS PRESSURE MEASUREMENT?

A. It is from Repeat Formation Test measurements taken on Conroe Field Unit 2315D.

Q. DO YOU HAVE ANY OTHER INFORMATION ON THE PRESSURE GRADIENT?

A. Yes. In TexCom's Bottom Hole Pressure Testing Results, submitted as part of this remand hearing, TexCom measured a pressure of 2437.2 psig at 6000 feet, which results in a pressure gradient of 0.406 psi per foot.

Q. BASED ON YOUR EXPERIENCE IN OPERATIONS AND AS A RESERVOIR ENGINEER, WHAT DOES THE DIFFERENCE BETWEEN VIRGIN PRESSURE AND THE CURRENT PRESSURE IN THE LOWER COCKFIELD INDICATE?

A. It indicates two things. First, the Lowe Cockfield at TexCom's well WDW410 appears to be depleted based upon a comparison of the current pressure versus expected virgin pressure. Second, since there has been no hydrocarbon production from the Lower Cockfield, the pressure should not be depleted—there must be communication above to a hydrocarbon productive zone.

Q. IF THERE WERE A PRESSURE DIFFERENCE BETWEEN THE UPPER AND THE LOWER COCKFIELD, WHAT SHOULD HAPPEN?

A. The pressure would likely cause fluid migration between the intervals. Fluids from the area of higher pressure, the Lower Cockfield, would tend to migrate to areas of lower pressure, the Upper Cockfield.

Q. HOW MIGHT THIS MIGRATION TAKE PLACE?

A. The fluids could migrate through vertical faults or fractures within the formation.

Q. ARE YOU FAMILIAR WITH DENBURY'S PLANS TO DEVELOP THE CONROE FIELD UNIT (CFU) IN PREPARATION FOR CO2 FLOODING FOR ENHANCED OIL AND GAS RECOVERY (EOR) OPERATIONS?

A. Yes.

Q. COULD YOU BRIEFLY DESCRIBE DENBURY'S PLANS?

A. Yes. At the end of 2009, Denbury purchased the CFU from Wapiti Operating, LLC for approximately $256,000,000 and over 11.6 million shares of Denbury stock. Denbury purchased the CFU with the purpose of using CO2 from the Jackson Dome production field in Jackson, Mississippi to flood the field for EOR. Denbury estimates that, of the original 1.3 billion barrels of oil in place, approximately 125 million barrels could be recovered by using CO2 injection.

Q. WHAT KIND OF CAPITAL INVESTMENT IS DENBURY PLANNING TO MAKE IN ORDER TO DEVELOP THESE 125 MILLION BARRELS IN THE CFU THROUGH CO2 EOR?

A. Denbury plans to develop a substantial infrastructure to transport CO2 to the Conroe Field for EOR. Denbury will invest approximately $750 million to $1 billion to construct

the infrastructure needed to carry out the EOR operation, including constructing a CO2 pipeline from the Green Pipeline to the CFU, recycle/compression facilities, and extensive other infrastructure.

Q. CAN YOU TELL US A LITTLE ABOUT THIS INFRASTRUCTURE?

A. Yes. First, Denbury will build an 80 mile pipeline to transport CO2 to the CFU. Denbury will also drill new wells for the injection of CO2, build recompression facilities to recycle produced CO2, and build in-field infrastructure to support the recompression/recycling of CO2.

Q. DOES DENBURY HAVE EXPERIENCE IN CONDUCTING OTHER CO2 EOR PROJECTS LIKE THE ONE PLANNED FOR CONROE?

A. Yes. Denbury's core business model includes acquiring properties where we believe additional value can be created through CO2 EOR. Denbury is the leading tertiary oil company in the Gulf Coast region. Denbury also has over 10 years of experience with CO2 EOR fields throughout the Gulf Coast region.

Q. HOW DOES THIS PROJECT COMPARE TO DENBURY'S PRIOR EXPERIENCE WITH CO2 EOR PROJECTS?

A. Denbury will have conducted 8 phases of prior CO2 flood installations throughout Mississippi, Louisiana, and Texas before this project begins. To date, Conroe will be the largest such field undertaken by Denbury.

Q. PLEASE GENERALLY DESCRIBE HOW CO2 IS USED IN ENHANCED OIL AND GAS RECOVERY.

A. CO2 injection for EOR is a process by which highly-pressurized CO2 (supercritical) is injected into an oil-productive reservoir in order to revitalize production. The process

relies upon the interaction between CO2 and oil. Injected CO2 helps mobilize oil to move towards producing wells. After injection, the CO2 migrates through the formation contacting oil droplets, expanding and moving them toward producing wells. The producing wells are the conduits through which all fluids are moved to the surface. Once at surface, the fluids are then transported via flow line to a processing facility. At the processing facility, CO2 is stripped from the stream and then sent for recompression and reuse in the field—this is Denbury's CO2 recycle process.

Q. HOW DOES DENBURY DESIGN ITS RESERVOIR INJECTION LOCATIONS?

A. Denbury plans to use specified CO2 patterns for EOR in the CFU. In the case of the CFU 1st & 2nd main sands, Denbury will use a "five spot" CO2 pattern. The five spot CO2 pattern consists of four injectors surrounding one producer. In the case of the CFU 3rd and 4th sands, Denbury will use an "inverted nine-spot" CO2 pattern. The inverted nine spot CO2 pattern consists of nine producers surrounding one injector. These pattern types allow Denbury to manage the migration of CO2 within the reservoir.

Q. I AM HANDING YOU DENBURY EXHIBITS 20 AND 21. DO YOU RECOGNIZE THESE TWO ITEMS THAT HAVE BEEN MARKED AS DENBURY EXHIBITS 20 AND 21?

A. Yes.

Q. WHAT ARE THEY?

A. These are maps from the Conroe Field indicating the planned CO2 patterns for EOR.

Q. WERE THESE MAPS MADE AND KEPT IN THE ORDINARY COURSE OF DENBURY'S REGULARLY CONDUCTED BUSINESS ACTIVITY?

A. Yes.

Q. IS IT IN THE REGULAR PRACTICE OF DENBURY'S BUSINESS ACTIVITY TO MAKE MAPS LIKE THIS?

A. Yes.

Q. WERE THE MAPS MADE AT OR NEAR THE TIME OF THE EVENT THAT IT RECORDS?

A. Yes.

Q. WERE THE MAPS MADE BY, OR FROM INFORMATION TRANSMITTED BY, A PERSON WITH KNOWLEDGE ACTING IN THE REGULAR COURSE OF BUSINESS?

A. Yes.

Q. DO YOU ADOPT THE INFORMATION ON DENBURY EXHIBITS 19 AND 20 AS YOUR TESTIMONY SHOWING THE PLANNED CO2 PATTERNS FOR DENBURY'S EOR?

A. Yes.

DENBURY OFFERS THE FOLLOWING CONROE FIELD MAPS AS EXHIBITS 20 AND 21.

Q. WHAT IS THE SIGNIFICANCE OF CO2 PATTERN MANAGEMENT?

A. By using specified CO2 patterns, Denbury is able to closely monitor each place where CO2 molecules will travel throughout the reservoir. This helps Denbury ensure that CO2 moves in the preferred path for EOR production, maintaining efficiency, and minimizing CO2 migration to un-preferred areas of the reservoir.

Q. WHY IS THAT IMPORTANT?

A. Managing the migration of CO2 is critical to the economics of successful CO2 EOR. When CO2 travels outside a desired path, it fails to properly push oil droplets toward the producing wells. The loss of this interaction between the CO2 and oil droplets results in lost revenue to the company.

Q. WHAT ARE DENBURY'S IMMEDIATE PLANS FOR THE CFU?

A. For the first 3-4 years, before the implementation of CO2 EOR, Denbury will continue current operations (producing oil, water, and natural gas) in the field.

Q. WHAT IS DENBURY'S SCHEDULE FOR DEVELOPING THE CFU THROUGH EOR?

A. Denbury anticipates initial EOR production within 5 years. Prior to production, Denbury will build the CO2 infrastructure, including drilling injection wells and installing production and injection infrastructure and recompression facilities.

Q. WHERE WILL DENBURY ACQUIRE CO2 FOR ITS OPERATIONS?

A. Denbury currently has approximately 6 TCF of CO2 in Jackson Dome, the CO2 source field for Denbury's operations. However, should other sources of CO2 become available, Denbury would consider their use in the CFU.

Q. HOW WILL DENBURY DELIVER CO2 TO THE CONROE?

A. It will be delivered by pipeline. Denbury is now finalizing construction on the Green Pipeline, a 341 mile pipeline from Donaldsonville, Louisiana to Alvin, Texas. Denbury will construct a branch off of this pipeline to the Conroe Field. This branch will deliver the CO2 needed by Denbury to initiate CO2 EOR.

Q. WHAT WILL HAPPEN WHEN DENBURY BEGINS PUMPING CO2 INTO THE CFU?

A. The pressure in the CFU (which is the productive interval) will rise from its current depleted pressure gradient to a higher pressure gradient, settling at near-virgin pressure when Denbury has completely flooded the CFU.

Q. AFTER DENBURY FLOODS THE FIELD WITH CO2, WILL IT DO ANYTHING ELSE TO ALTER THE PRESSURE PROFILE OF THE COCKFIELD FORMATION?

A. Yes. After the CO2 is injected, Denbury will utilize many existing wellbores and drill a number of new wells for fluid production throughout the Conroe Field. These wells will introduce a number of new pressure sinks that will, consequently, lower the pressure of the Upper Cockfield at those points.

Q. WHY IS RE-PRESSURIZING THE CFU TO NEAR-VIRGIN PRESSURES KEY FOR SUCCESSFUL EOR?

A. As the field was produced over its more than 70-year lifespan, the pressure in the producing Conroe Unit was depleted. By increasing the pressure in the interval, we will cause the migration of oil (including water, oil, and other fluids) to producing wells. This is because fluids will always migrate from higher pressure to lower pressure.

Q. WHAT WILL DENBURY'S INJECTION DO TO THE PRODUCING INTERVAL?

A. When Denbury injects CO2 into the producing interval for CO2 EOR operations, it will re-pressurize the producing interval to near-virgin pressure. This will create the pressure required to cause fluid migration to the producing wells and necessary to cause the oil to rise in the wellbore to the surface for processing.

Q. WILL DENBURY'S PLANS TO RE-PRESSURIZE THE CFU HAVE ANY IMPACT BEYOND THE PRODUCING INTERVAL?

A. Yes. When Denbury re-pressurizes the CFU to near-virgin pressure, it will necessarily impact the pressures throughout the entire Cockfield formation. This is because the increase in pressure will be transmitted through any conduit that connects the Cockfield intervals.

Q. WHAT WILL BE THE EFFECT ON THE COCKFIELD FORMATION WHEN DENBURY RE-PRESSURIZES THE CFU?

A. Pressure will likely increase throughout the entire Cockfield Formation due to communication among the sands of the Upper, Middle, and Lower Cockfield. I know this communication is occurring because of the pressure gradient evidence that I discussed earlier in my testimony. The communication likely occurs through significant faulting that is a vertical pathway throughout Cockfield intervals.

Q. CONVERSELY, WHAT WOULD OCCUR IF THE LOWER COCKFIELD WERE PRESSURIZED ABOVE ITS CURRENT DEPLETED PRESSURE?

A. In terms of pressure, a similar result. Pressure would increase throughout the Upper, Middle, and Lower Cockfield Formation, regardless of whether the pressure was increased in either the Lower, Middle, or Upper Cockfield beyond the pressure gradient of the other surrounding or adjacent intervals.

Q. WHY WOULD THE PRESSURE INCREASE THROUGHOUT THE ENTIRE COCKFIELD?

A. Because the fluid from the interval at higher pressure would migrate to the interval with lower pressure, thus increasing the pressure in the lower-pressure interval. The intervals would attempt to attain equilibrium.

Q. WHY DOES THE CO2 INJECTED BY DENBURY NOT OPERATE IN A SIMILAR FASHION, MOVING FROM THE HIGHER TO THE LOWER INTERVAL?

A. Because CO2 is less dense than most fluids. Thus, it will sit atop any heavier fluid and it will just displace the heavier fluid downwards. In this case, it would sit atop the fluids present in the Upper Cockfield formation.

Q. HOW WILL THE PRODUCTION OPERATIONS THAT ARE PART OF THE CO2 EOR IMPACT PRESSURE IN THE UPPER COCKFIELD?

A. As a part of the CO2 EOR, Denbury will produce fluids from 32 additional producing wells (compared to active producing wells today) north of the 4400 EW fault in the unitized interval. Each of these production wells will be a pressure sink.

Q. WHAT IS THE SIGNIFICANCE OF FLUID MOVEMENT FROM HIGH PRESSURE TO LOW PRESSURE INTERVALS IN THE CFU?

A. Usually, this is not significant, as this would simply draw more preexisting formation fluids into the reservoir for production. However, if incompatible fluids are injected in the Lower Cockfield causing a higher-pressure zone, there is a risk that those fluids will migrate up and into a lower pressure zone. In this case, that lower pressure zone is the Upper Cockfield (CFU) productive oil and gas zone.

Q. WHEN INJECTED, WHERE WILL THIS CO2 COLLECT WITHIN THE FORMATION?

A. Unlike heavier liquids, the CO2 will have a tendency to rise within the formation, because the CO2 is less dense than oil, water, or most other naturally occurring fluids in the formation.

Q. HOW IS THE CO2 DENBURY PLANS TO INJECT INTO THE FORMATION DIFFERENT THAN THE LIQUIDS TEXCOM WOULD BE PERMITTED TO INJECT?

A. Denbury's CO2 will be injected into the Upper Cockfield. The fluids that TexCom proposes to inject would (according to their application) be injected into the Lower Cockfield first. The light fluids that TexCom plans to inject would behave in a similar fashion to Denbury's CO2—they would move through the denser fluids and migrate toward the lower-pressure interval where Denbury is producing.

Q. ARE YOU FAMILIAR WITH TEXCOM'S PLAN TO INSTALL A CLASS I NON-HAZARDOUS INJECTION WELL INTO THE CONROE?

A. I am.

Q. EARLIER, YOU HAD INDICATED THAT YOU HAD FORMED AN OPINION REGARDING THIS PLAN.

A. Yes.

Q. WHAT IS YOUR OPINION?

A. As I discussed earlier, when the pressure profile that will be developed by TexCom interacts with the pressure profile created by Denbury's current and future operations, the interaction of the two will cause TexCom's injected fluids to be produced at the surface.

Q. WHAT IS THE BASIS FOR THIS OPINION?

A. As discussed earlier, the migration of fluids is driven by pressure difference. The pressure difference created by TexCom's operations will result in the upward migration of its injected waste.

Q. WHAT INFORMATION DID YOU USE TO EVALUATE PRESSURE GENERATED BY TEXCOM'S PROPOSED OPERATIONS.

A. I used the recent modeling reports completed by ALL Consulting. I also used information on pressures I obtained from Jim Fairchild.

Q. WHAT DID THESE TWO PIECES OF INFORMATION INDICATE TO YOU?

A. Both of the pressures are more than sufficient to allow migration from the Lower Cockfield to the Upper Cockfield. In fact, these pressures would be sufficient to allow migration even if the Upper Cockfield were at virgin pressure and no oil and gas production was occurring.

Q. WHAT OTHER PROBLEMS HAVE YOU IDENTIFIED WITH TEXCOM'S PROPOSED OPERATIONS?

A. TexCom is planning to drill a Class I Non-Hazardous Disposal Well directly through hydrocarbon productive formations. TexCom's Injection Zone overlaps with the Conroe Field Unit defined interval. Although TexCom's Injection Interval only includes perforations in the Lower Cockfield, their current wellbore set-up would allow them to perforate higher, they could make additional perforations up to the depth of their packer. In addition, there is the possibility that the casing of TexCom's proposed well, below the packer and above the Injection Interval, could be a point of failure for the containment of fluids within the wellbore.

Q. WHAT WOULD BE THE IMPACT OF ADDITIONAL PERFORATIONS BY TEXCOM ABOVE THE INJECTION INTERVAL?

A. Some perforations above the injection interval would be directly within the producing interval of the CFU. The current placement of TexCom's packer gives them the ability to

perforate throughout their entire Injection Zone. TexCom would then be injecting fluids directly into a productive hydrocarbon recovery zone.

Q. IF TEXCOM DETERMINED NOT TO PERFORATE ABOVE THE INJECTION INTERVAL, ARE THERE ANY PROBLEMS WITH WHERE THEIR PACKER IS CURRENTLY LOCATED?

A. Yes. The casing could be susceptible to failure via corrosion or other type of leak.

Q. IN WHAT OTHER RESPECTS IS TEXCOM'S PLANNED CLASS I NON-HAZARDOUS INJECTION WELL INCOMPATIBLE WITH DENBURY'S OPERATIONS?

A. TexCom's Class I Non-Hazardous Injection Well is incompatible with oil and gas production because of their proximity to productive wells and their injection of incompatible fluids. Denbury currently has approximately 10 wells that produce hydrocarbons (including produced water) within about 1 mile of TexCom's proposed wells. These 10 wells have their producing intervals in the Conroe Unit. The closest of these wells is within 3000 feet of TexCom's well, that will be injecting incompatible fluids into the Cockfield formation. The current pressures being created by Denbury's operations are not at great distances from TexCom's wells. Additionally the CO2 injection and production wells we propose for the CO2 EOR will be even closer to TexCom's well.

Q. DO YOU HAVE ANY OPINION HOW DENBURY'S OPERATIONS WILL IMPACT TEXCOM EXPERT GREG CASEY'S CALCULATION OF PLUME RADIUS?

A. Yes. Although TexCom's expert Greg Casey has used the proper calculation for purely radial flow, this erroneously assumes that the reservoir exhibits purely radial flow. In the

real world, however, reservoirs are rarely if ever purely homogeneous both horizontally from a wellbore or vertically along a wellbore. I further confirmed this conclusion through my discussion with Jon Herber, and upon his review of the Conroe Field geologic data, this appears to hold true for the Cockfield intervals. In addition, when pressure sinks (or producing wells that are acting as pressure sinks) are communicating with a lower formation, the migration of injected fluids would tend not to move purely radially away from their source. Instead, the molecules would have a tendency to migrate toward the pressure sinks. In this case, the injected fluids would migrate through the Lower Cockfield, towards fault 4400 EW, up that fault, and into the active hydrocarbon recovery zone. Thus, instead of a circle, the plume radius would most likely exhibit a bell shape, with the wide part along the fault.

Q. WHAT WOULD HAPPEN IF THE FLUIDS TEXCOM PLANS TO INJECT MIGRATED INTO THE PRODUCTIVE ZONE?

A. They would be extracted and produced by Denbury through Denbury's EOR.

Q. DOES THIS CONCLUDE YOUR PRE-FILED TESTIMONY?

A. Yes.

EXHIBIT 19

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EDUCATION

Southern Methodist University Dallas, Texas

- Bachelor of Science in Mechanical Engineering, Cum Laude, May 2004
- Lindsay Embrey Academic Excellence Scholarship & University Scholars Academic Award
- Golden Key International Honour Society & Alpha Lambda Delta Honors Fraternity

WORK EXPERIENCE

Denbury Resources Inc. Plano, Texas

Operations & Reservoir Engineer *December 2007 - Currently*

- Resposible for engineering and evalution of the Conroe Field Unit reservoir to maintain and develop oil production
- Developing economics for capital workovers and acquisition opportunities as part of Conroe Field Unit capital budget
- Designing future CO2 flood for Conroe Field Unit to maximize oil production
- Managed Jackson Dome CO2 source field capital and operating budgets; budget for 2008 exceeded $135MM
- Project managed and engineered completions and workovers of deep (+ 17,000') onshore CO2 source wells at Jackson Dome including perforating, chrome tubulars, inconel packers, and unique techniques for cost savings and budget expediting
- Project managed and engineered CO2 dehydration facilities at Jackson Dome including design of corrosion resistant alloys/costings and standardization of installations
- Developed optimization programs for Jackson Dome; lead team to achieve 2009 operating expense reduction project

Occidental Permian Ltd. Levelland, Texas

Production & Facilities Engineer *June 2004-December 2007*

- Project managed the WRKM Ph1 CO2 flood (EOR) installation through completion; coordinated standardization with previous and on-going CO2 flood installations
- Recognized a near-term opportunity lost situation due to CO2 shortage and insufficient water injection capacity; utilized WAG philosophy and capacities to optimize
- Project managed and engineered the design and construction of the "SLABO" oil processing and sales facility; innovative initiatives and execution of budget/deadline goals
- Evaluated and developed the FRU residue gas elimination project which was utilized as a cost

DENBURY
Exhibit 19

reduction and HES initiative to eliminate wasted instrument gas

- Prepared various economic project evaluations using PEEP economics program to consider cost reduction, reduced downtime and increased capacity benefits of capital expenditures
- Coordinated and engineered the CLU oil processing facility redesign, the development of which integrated existing infrastructure to reduce project timeline and cost

Netherland, Sewell & Associates, Inc. Dallas, Texas

Oil & Gas Consulting Internship *Summer 2003*

- Investigated well bore video to generate a probable cause-of-failure video log and accompanying interpretation of well history for legal and insurance claims
- Constructed a detailed well structure analysis report in preparation for economic profitability and geologic assessments
- Computed estimated oil reserves by volumetric, offset well and past field performance methods to evaluate economic impact

Wynn Crosby Energy, Inc. Ratliff City, Oklahoma/Plano, Texas

Oil Field/Engineering Intern *Summer 2002*

- Generated a systematic form to verify well histories, detect recurring well failures and influence preventative measures
- Aided in the daily maintenance, operations and repairs of the oil field as well as researched the application of various equipment types

ORGANIZATIONS AND POST-COLLEGIATE COURSES

Society of Petroleum Engineers	Dallas, Texas
Economic Evaluation and Investment Decision Methods	Golden, Colorado
Production Operations I—Petroskills Course	Houston, Texas
Occidental Negotiation Skills Workshop	Houston, Texas
Pumps and Compressors—John M. Campbell Course	Houston, Texas
Occidental Basic Petroleum Economics Workshop	Los Angeles, California
Gas Conditioning and Processing—John M. Campbell Course	Norman, Oklahoma
Occidental Business Awareness Course	Houston, Texas

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EXHIBIT 20

Oversize Exhibit
Delivered via hand delivery

EXHIBIT 21

Oversize Exhibit
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